Changes in food intake to reduce CO_2 emissions and have a healthy diet.

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1. Background

Human activities are causing global warming by CO_2 emissions, such as diet. Almost 30% of CO_2 emissions comes from our diets. [1,2,3]

Meat and dairy products contribute the most to CO_2 emissions due to farming methods, processing, packaging, transportation.[2, 3] High consumption of these products is also linked with health conditions.

Fruits and vegetables are linked to health benefits and they are low in CO_2 emissions. However, their consumption is currently relatively low. [1,2,3]

To date, changes in food intake have been studied for the average population diet, which suggest radical changes in our diets (200% change from current food intake).

Average population diet does not take into account personal food preferences and the changes suggested may not be acceptable. These issues will be addressed in this study.

2. Methodology

This study will explore the changes that each individual will have to make without altering their current diet greatly to reduce CO_2 emissions and have a healthy diet.

An optimisation algorithm will be used to find the best combinations of foods for each individual (Figure 1).

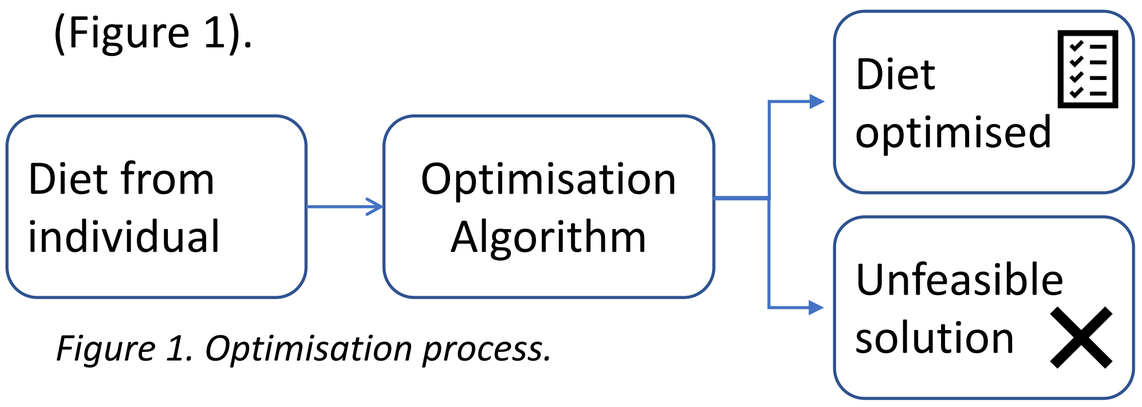


Figure 1. Optimisation process.

The data used in this study are:

- Recommendations for nutrients.
- Diets from 212 individuals.
- CO_2 emissions data per food item from production to retailer.

3. Results

1. Meat, dairy, fruits and vegetables contribute the same to food intake, but meat and dairy have considerably higher CO_2 emissions (Figure 2).

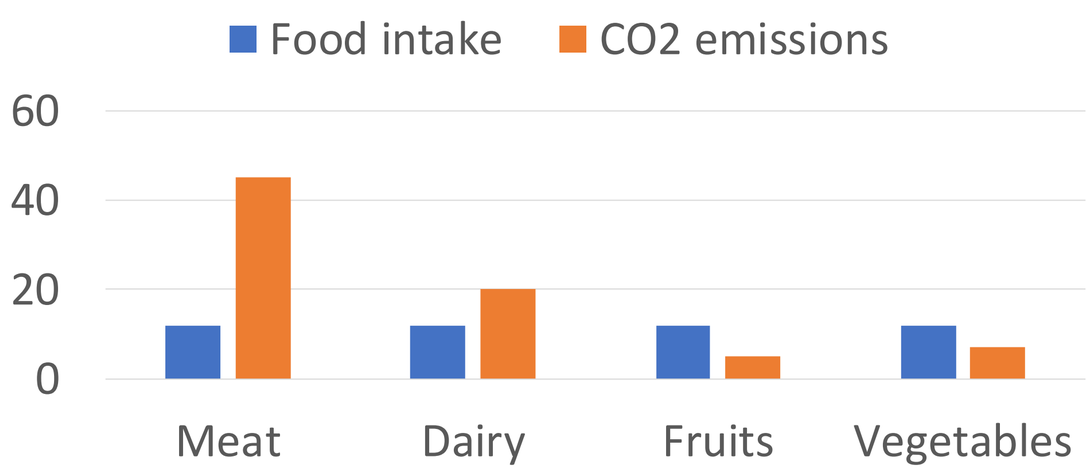


Figure 2. Percentage of contribution to food intake and CO_2 emissions of average daily diet per food group.

2. 100/212 (47%) individuals in the sample had an optimised diet as the result.
3. 6.94 kg CO_2 emissions per person per day from the sample diets. After the optimisation, the optimised diets had 30% less CO_2 emissions per person per day.
4. Meat and dairy intake was reduced by 23% for both, whereas fruits and vegetables were increased by 30% and 4% respectively.

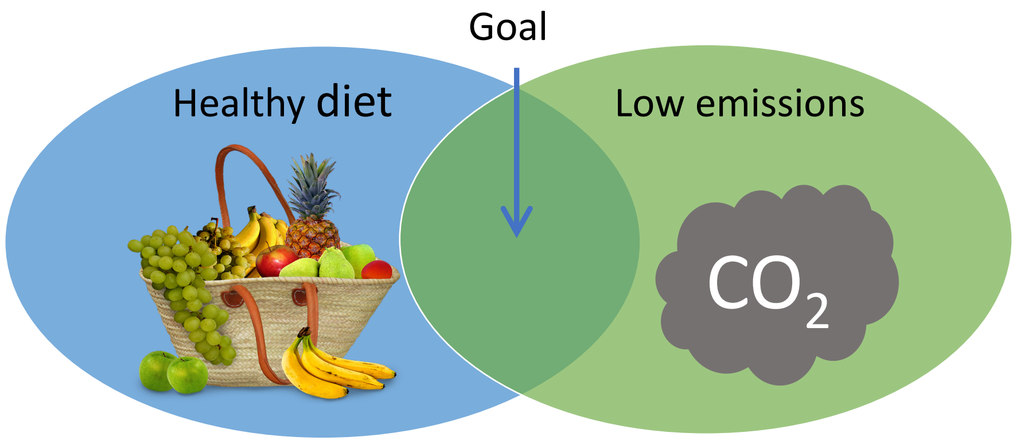
4. Conclusion

Meat, dairy, fruits and vegetables contribute equally to food intake, but meat and dairy significantly higher to the average daily CO_2 emissions.

Optimising individual diets can produce healthy combinations of food groups to achieve a diet lower in CO_2 emissions.

It is possible to achieve a healthier and more environmentally friendly diet without altering the food intake greatly.

Decreasing meat and dairy and increasing fruits and vegetables can lead to a healthy diet with lower environmental footprint, which should be our goal.



References

1. Horgan et al, 2016, *International Journal of Behavioural Nutrition and Physical Activity*
2. Green et al, 2015, *Climate Change*
3. Macdiarmid et al, 2012, *American Journal of Clinical Nutrition*